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21. (New) A radiation detecting apparatus according to claim 20, further comprising a shock absorber arranged between said photoelectric converter unit and said cabinet, said shock absorber covering entirely said light receiving surface of said photoelectric converter unit.

22. (New) A radiation detecting apparatus according to claim 20 or 21, wherein said shock absorber contains a gelled material.

REMARKS

Claims 1 to 22 are pending in this application. Claims 1, 11, and 20 are the independent claims.

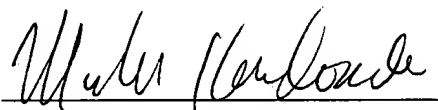
Claims 1 through 5 and 7 through 16 have been amended to improve their form. Claims 17 through 22 are newly-presented. Newly-presented Claims 17 to 22 have been added to provide Applicant with an additional scope of protection. No new matter has been added.

The Specification and Abstract have been amended as to matters of form. No new matter has been added.

Applicant respectfully submits that the present application is in condition for allowance and favorable consideration and early passage to issue of the present application are earnestly solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Michael E. Kondoudis", is written over a horizontal line.

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APPENDIX

VERSION SHOWING CHANGES MADE TO CLAIMS

1. (Amended) A two-dimensional image pickup apparatus comprising:
an apparatus cabinet containing therein a substrate member and a two-dimensional photoelectric converter unit having a light receiving surface, the light receiving surface comprising a plurality of photoelectric converters formed on [the] said substrate member, [at least the] said photoelectric converter unit being arranged on a base member, and [the portion of the] said cabinet having a deformable top plate located opposite to [its light receiving section is deformable] said light receiving surface of said photoelectric converter unit and said top plate being less rigid than said base member.

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2. (Amended) A two-dimensional image pickup apparatus according to claim 1, wherein [the portion of the cabinet located opposite to the light receiving section] said top plate can [restore the] return to an original position after deformation.

3. (Amended) A two-dimensional image pickup apparatus according to claim 1, wherein the magnitude of deformation of [the portion of the cabinet located opposite to the light receiving section] said top plate is greater than that of [the] said substrate member.

4. (Amended) A two-dimensional image pickup apparatus according to claim 1, [wherein] further comprising a shock [absorbing means is] absorber arranged between said [the] photoelectric converter unit and said [the] cabinet.

5. (Amended) A two-dimensional image pickup apparatus according to claim 4, wherein [the] said shock [absorbing means] absorber comprises one or more containers.

6. A two-dimensional image pickup apparatus according to claim 5, wherein the containers are air bags.

7. (Amended) A two-dimensional image pickup apparatus according to claim 5 [1], wherein said photoelectric converters output electric signals and said apparatus further [comprising] comprises a circuit board for processing the electric signals from said [the] photoelectric converters [also contained in the image pickup apparatus], said circuit board having electronic parts cooled by a cooling liquid [being] contained in a sealed state at least in the containers held in direct contact with the electronic parts arranged on [the electric] said circuit board [substrate].

8. (Amended) A two-dimensional image pickup apparatus according to claim 1, wherein [the portion of the cabinet located opposite to the light receiving section] said top plate is [made] comprised of resin.

9. (Amended) A two-dimensional image pickup apparatus according to claim 8 [1], wherein the resin contains carbon-fiber-reinforced resin.

10. (Amended) A two-dimensional image pickup apparatus according to claim 1, wherein [the] said photoelectric converter unit [include] includes a fluorescent body.

11. (Amended) A two-dimensional image pickup apparatus comprising:
a substrate[,];
a photoelectric converter unit having a plurality of photoelectric converters formed on [the] said substrate; [and]
a cabinet containing [the] said photoelectric converter unit[,]; and
a shock [absorbing means] absorber [being arranged] disposed between [the] said photoelectric converter unit and [the] said cabinet.

12. (Amended) A two-dimensional image pickup apparatus according to claim 11, wherein [the] said shock [absorbing means] absorber comprises one or more containers.

13. (Amended) A two-dimensional image pickup apparatus according to claim 12, wherein [the containers contain] each of the one or more containers contains a gas in a sealed state.

14. (Amended) A two-dimensional image pickup apparatus according to claim 12, wherein the one or more containers are air bags.

15. (Amended) A two-dimensional image pickup apparatus according to claim 11, further comprising:

a circuit board [contained in the cabinet] for processing electric signals relating to [the] said photoelectric converters, said circuit board contained in said cabinet and having electronic parts; and

a cooling [means] device held in contact with the electronic parts of [the] said circuit board [substrate].

16. (Amended) A two-dimensional image pickup apparatus according to claim 15, wherein [the] said cooling [means] device comprises one or more containers containing a cooling liquid therein.

APPENDIX

VERSION SHOWING CHANGES MADE TO SPECIFICATION

The paragraph starting at page 1, line 10, and ending at line 22, has been amended as follows:

--FIG. 1 of the accompanying drawings schematically illustrates a known image pickup apparatus adapted to X-ray photography and comprising a fluorescent member (e.g., scintillator) 1 for converting X-rays into rays of visible light, photoelectric converters 2a for converting visible light into electric signals, a substrate 2b that carries [carrying] the photoelectric converter 2a [thereon], a base member 7 that supports [supporting] the substrate 2b [thereon], circuit boards 5a, 5b for processing electric signals produced by photoelectric conversion, wires connected to the circuit boards, and an apparatus cabinet 8 containing the above components.--

The paragraph starting at page 2, line 15, and ending at line 23, has been amended as follows:

--When the photoelectric converters 2a are required to be moisture-resistant, the fluorescent member 1 and the photoelectric converters 2a may be wrapped and hermetically sealed by a moisture-impermeable and X-ray transmissive film 6. Then, they are bonded and securely held to the base member 7 before being placed [contained] in the apparatus cabinet 8 to complete the operation of assembling the image pickup apparatus for X-ray photography.--

The paragraph starting at page 2, line 24, and ending at page 3, line 2, has been amended as follows:

--Such image pickup apparatuses are conventionally used [for X-ray photography] as stationary apparatuses [apparatus] for X-ray photography. However, in recent years, there is an increasing demand for a lightweight, compact and portable image pickup apparatus adapted to rapid imaging operations and capable of [for] producing fine images.--

The paragraph starting at page 3, line 3, and ending at line 15, has been amended as follows:

--Additionally, image pickup apparatuses [apparatus] having the above described configuration are required to safeguard the substrate 2b and other related components against impacts that can be applied thereto during transportation. [and the apparatus] The apparatuses are also required to be safeguarded as a whole against deformations that can be caused by the external load (mainly the weight of the person to be photographed) applied to [of] the apparatus during X-ray photographing operations. To meet these requirements, [then] the apparatus cabinet 8 has to be structurally very robust and this necessity of being robust has been obstructing the attempt to down-size and reduce the weight of the apparatus.--

The paragraph starting at page 3, line 18, and ending at line 25, has been amended as follows:

--In view of the above described circumstances, it is therefore an [the] object of the present invention to provide an image pickup apparatus for X-ray photography that is structurally able [adapted] to absorb external impacts and possible resultant deformations, such as deflections of the cabinet, so that the interior is protected against damage and remains intact if the cabinet is deformed by the external load.--

The paragraph starting at page 3, line 26, and ending at page 4, line 8, has been amended as follows:

--According to the present invention, the above object of the invention is achieved by providing a two-dimensional image pickup apparatus comprising an apparatus cabinet containing therein a substrate member and a photoelectric converter unit having a plurality of photoelectric converters formed on the substrate member. At [at] least the photoelectric converter unit is [being] arranged on a base member, [and the] The portion of the cabinet located opposite to its light receiving section is deformable.--

The paragraph starting at page 4, line 16, and ending at line 22, has been amended as follows:

--According to the present invention, there is also provided an image pickup apparatus comprising a substrate, a photoelectric converter unit having a plurality of

photoelectric converters and a cabinet containing the photoelectric converter unit, and a shock absorbing means being arranged between the photoelectric converter unit and the cabinet.--

The paragraph starting at page 4, line 23, and ending at line 24, has been amended as follows:

--For the purpose of the present invention, the shock absorbing means may be containers.--

The paragraph starting at page 4, line 25, and ending at line 26, has been amended as follows:

--For the purpose of the present invention, the containers may contain gas in a sealed state.--

The paragraph starting at page 4, line 27, and ending at page 5, line 7, has been amended as follows:

--A two-dimensional image pickup apparatus according to the present invention may further comprise a circuit board for processing electric signals from the photoelectric converters also contained in the apparatus cabinet, and cooling liquid [is] contained

in a sealed state at least in the containers held in direct contact with the electronic parts arranged on the circuit board.--

The paragraph starting at page 5, line 10, and ending at line 11, has been amended as follows:

--FIG. 1 is a schematic cross sectional view of a conventional [typical] two-dimensional image pickup apparatus.--

The paragraph starting at page 5, line 12, and ending at line 14, has been amended as follows:

--FIGS. 2, 3A, 4 and 5 are schematic cross sectional views of embodiments of a two-dimensional image pickup apparatus of the present [according to the] invention.--

The paragraph starting at page 5, line 15, and ending at line 17, has been amended as follows:

--FIG. 3B is a schematic perspective view of the embodiment of the two-dimensional image pickup apparatus of FIG. 3A.--

The paragraph starting at page 6, line 2, and ending at line 6, has been amended as follows:

--FIG. 2 is a schematic cross sectional view of a first embodiment of the invention. In FIG. 2, the components that are the same as or similar to those of the apparatus of FIG. 1 are denoted [respectively] by the same reference symbols.--

The paragraph starting at page 7, line 10, and ending at line 17, has been amended as follows:

--FIGS. 3A and 3B schematically illustrate a second embodiment of the invention, which will be specifically described below. There are shown a fluorescent member 1, two-dimensionally arranged photoelectric converters 2a, a substrate 2b typically made of glass, and a moisture-impermeable film 6₁ [, of which the] The moisture-impermeable film 6, the fluorescent member 1₁ and the substrate 2b are bonded together.--

The paragraph starting at page 8, line 11, and ending at line 17, has been amended as follows:

--During an X-ray photographing operation, the image pickup apparatus 8 is subjected to the load of the object to be photographed and can become deflected or otherwise

deformed. However, the containers 9 distribute the load. This prevents [and prevent] the load from being intensively borne by part of the substrate 2b and thereby causing damage [to get damaged].--

The paragraph starting at page 8, line 18, and ending at page 9, line 2, has been amended as follows:

--Since the apparatus cabinet 8 itself is required to be transmissive of X-rays and lightweight as pointed out above, it is typically formed by combining a metal plate and CFRP (carbon-fiber-reinforced plastic). Although [but] the load bearing capacity of the apparatus cabinet 8 [(that] may be improved by increasing the thickness of the cabinet, this will defeat [to baffle] the effort to reduce [of reducing] its weight. [] does not particularly have to be taken into consideration] In this embodiment, however, because the containers 9 operate as reinforcement for protecting the inner components as they are elastically deformed, the load bearing capacity of the apparatus cabinet 8 does not particularly have to be taken into consideration.--

The paragraph starting at page 9, line 15, and ending at line 24, has been amended as follows:

--The containers 9 containing cooling liquid in a sealed state are preferably held in contact with the electronic parts 5c and, at the same time, with the apparatus cabinet 8.

Those portions of the apparatus cabinet 8 that are held in contact with the related containers 9 are preferably [is advantageously] made of a thermally highly conductive material such as metal. Additionally, the apparatus cabinet 8 may be provided with heat-emitting fins (not shown), whose dimensions are, of course, confined within a permissible limit.--

The paragraph starting at page 10, line 16, and ending at line 20, has been amended as follows:

--As described above in detail, an image pickup apparatus adapted to X-ray photography according to the invention shows an improved shock-absorbing property and an enhanced load-bearing ability [bearability] to allow the apparatus to be further down-sized and become lightweight.--



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APPENDIX

VERSION SHOWING CHANGES MADE TO ABSTRACT

The Abstract has been amended as follows:

--An image pickup apparatus for X-ray photography is structurally adapted to absorb external impacts and possible resultant deformations such as deflections of the cabinet so that the interior is protected against damage and remains intact if the cabinet is deformed by the external load. The two-dimensional image pickup apparatus comprises a substrate, two-dimensional photoelectric converters formed on the substrate and an apparatus cabinet containing the substrate and the photoelectric converters. [in the inside, at] At least part of the apparatus cabinet is [being] deformable and capable of restoring its [restore the] original profile. A [or a] plurality of containers such as air bags may also be [being] inserted into the gap between the [said] substrate and the [said] apparatus cabinet to prevent the inner wall surface of the [said] apparatus cabinet and the [said] substrate from contacting each other.--

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